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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/683,343	12/17/2001	Larry Edgar Fennem	24-AT-6045	1326

23465 7590 05/25/2004
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EXAMINER

PALABRICA, RICARDO J

ART UNIT	PAPER NUMBER
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3641

DATE MAILED: 05/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/683,343

Applicant(s)

FENNERN, LARRY EDGAR

Examiner

Rick Palabrica

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 3/2/04 RCE and 2/3/04 Amendment.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 6-13 and 15-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 6-13, and 15-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Applicant's 3/2/04 Request for Continued Examination and associated 2/03/04 Amendment After Final and Remarks are acknowledged. Applicant's amendment cancels claims 4 and 14 and includes their limitations into independent claims 1 and 11, respectively.

The Amendment is allegedly in response to the 12/3/04 Final Office Action. However, the Remarks section includes traverse of prior art that were not applied in the rejection of claims in said Office Action, i.e., the combination of Nakamaru et al. - Chalfant, Jr., and this combination together with Kobayashi (see Remarks, page 5 to the middle of page 9). Accordingly, only remainder of the Remarks section, i.e., from the middle to page 9 to page 13, which is relevant to the traverse of the rejections in said Final Office Action, is addressed in this Office Action.

2. Applicant traversed the combination of Nakamaru et al. and Kessler et al. on the grounds that: a) the volume of Nakamaru's containment vessel 401 "appears to be larger than four times the volume of pressure vessel 201"; b) Kessler et al. "do not describe nor (*sic*) suggest a nuclear reactor containment vessel that has a pressure rating of at least 50 atmosphere, nor (*sic*) a containment vessel that has a volume less than four times the volume of a reactor pressure vessel that is located inside the containment vessel. Applicant's arguments have been fully considered but they are not persuasive for the reasons given below.

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As to argument a), note from Fig. 2 that both the containment vessel and the pressure vessel have a cylindrical configuration. Based on measurement of dimensions of these components from the drawing, the following values are obtained:

Containment Vessel 401

Diameter (d) = 19.5 mm

Equivalent height (h) = 43.5 mm

Volume = $V_c = (\pi d^2/4) \times h = 12,990 \text{ mm}^3$

Pressure Vessel 201

Diameter (d) = 12 mm

Equivalent height (h) = 30 mm

Volume = $V_p = (\pi d^2/4) \times h = 3620 \text{ mm}^3$

Containment vessel to pressure vessel volume ratio = $V_c / V_p = 12,990/3620 = 3.6$. This ratio meets the claim limitation. Note that while patent drawings are not drawn to scale, relationships clearly shown in the drawings of a reference patent cannot be disregarded in determining the patentability of the claims. See In re Mraz, 59 CCPA 866, 455 F.2d 1069, 173 USPQ 25 (1972).

As to argument b), Kessler specifically discloses that his containment can withstand inner pressure pulses of more than 23 MPa peak value (see page 22, column 1, 1st full paragraph). This pressure-withstanding capacity is equivalent to 230 atmospheres, or more than 4 times the claimed 50 atmosphere pressure rating.

As to the remainder of argument b), Kessler is applied only as a secondary reference and its teaching on containment pressure rating is used to modify the primary reference, Nakamaru. As such, Kessler does not have to disclose all of the elements of the claim. As stated in the Final Office Action, the primary reference, Nakamaru,

discloses the applicant's claims except for the pressure rating of the containment. If Kessler had all the elements cited by the Applicant in the traverse, then there would be no need to apply Kessler as a secondary reference because it would qualify as a stand-alone reference that fully anticipates the claims.

3. Applicant traversed the use of Kobayashi on the same grounds as those cited for Kessler. Again, the Examiner disagrees for the same reason given above, i.e., Kobayashi is applied only as a teaching reference to modify the primary reference. As to the further allegation that Kobayashi does not describe or suggest any containment vessel, the Examiner disagrees. Kobayashi's pressure vessel functions as a containment vessel because it has a pressure rating, it "contains" or holds any potential radioactive releases from the enclosed fuel assemblies, and it mitigates the consequences of these releases.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-3, 6-9, 11-13 and 15-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamaru et al. (U.S. 2002/0085660) in view of Kessler et al.

(Proceedings of the Fifth International Conference on Emerging Nuclear Energy Systems, Karlsruhe, 3-6 July 1989). Nakamaru et al. disclose applicant's claims except for the pressure rating of the containment vessel.

Nakamaru et al. disclose a boiling water reactor nuclear power plant with a compact system configuration (see Figs. 1-15). Fig. 2 shows a boiling water reactor comprising a reactor pressure vessel 201, a reactor core inside the pressure vessel 202, a metal steel containment vessel 401 enclosing said pressure vessel, and the containment vessel comprising a bottom head, removable top head, and a substantially cylindrical sidewall. Note in Fig. 14 that the top head of the containment vessel is removable as evidenced by the pressure vessel being lifted through an opening on top of the reactor building. There is a drywell 231 about the open circumference of the pressure vessel 201. This drywell and a pressure suppression pool are inside the containment vessel. There is a plurality of containment penetrations (407, 234, 430, etc). An isolation condenser 225 is provided (see Fig. 3). There is a guard pipe 407 that encloses a depressurization valve that is part of the emergency core cooling system, said pipe guard drains into the containment vessel. There is a plurality of isolation valves between the containment vessel and the reactor pressure vessel (see Fig. 3).

As to the limitation in claim 15 regarding isolation of the drywell from the reactor pressure vessel by a remotely actuated valve, note in Figs. 2 and 10A, for example, that there is a pipe 234 that connects the reactor pressure vessel 201 to the suppression pool 404 via a check valve and shutoff valve 224 (see also page 7, paragraph 0120). The suppression pool 404 is also connected to the drywell via pipe 430 and a valve

235a that opens at a predetermined signal or temperature (see page 9, paragraph 0152). Therefore, there is a fluid path from the inside of the pressure vessel 201 to the drywell 231 via the suppression pool 404. Valve 235a provides isolation between the reactor pressure vessel and the drywell.

Kessler et al. teach a nuclear reactor containment that is designed hydrogen detonation in the event of a core melt accident resulting in penetration of the melt into the containment basemat (see section 3, page 20 and section 7, page 22). Their containment comprising of steel can withstand a peak pressure of 23 MPa (230 bars) (see section 3, page 20 and section 7, page 22).

One having ordinary skill in the art would have recognized that a nuclear power plant containment must be designed to cope with the consequences of severe accidents, including a core melt that results in hydrogen generation and detonation, said hydrogen released from steam/fuel cladding reaction.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus, as disclosed by Nakamaru et al., by the teaching of Kessler et al., to have a containment vessel having a pressure rating of at least 50 atmospheres because such modification is no more than the use of well-known values of pressure rating of nuclear containment structures.

The claims are replete with statements that are either essentially method limitations or statements of intended or desired use. For example, "for a boiling nuclear reactor, the boiling water reactor comprising a reactor pressure vessel", "to receive and enclose a reactor pressure vessel", "forged and machined into a substantially complete

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one piece unit at a location remote from the nuclear reactor", etc. These clauses, as well as other statements of intended use do not serve to patently distinguish the claimed structure over that of the reference, as long as the structure of the cited references is capable of performing the intended use. See MPEP 2111-2115.

See also MPEP 2114 that states:

A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647.

Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. In re Danly, 263 F.2d 844, 847, 120 USPQ 528, 531.

[A]pparatus claims cover what a device is, not what a device does." Hewlett-Packard Co. v. Bausch & Lomb Inc., 15 USPQ2d 1525, 1528.

As set forth in MPEP 2115, a recitation in a claim to the material or article worked upon does not serve to limit an apparatus claim.

As to the limitation in claims 9 and 20 regarding off-site manufacture of the bottom head and sidewall into a substantially complete one piece, this is a method limitation. See above.

Note that the Nakamaru et al. – Kessler et al. combination is capable of being operated in the same manner and for the same intended use as the claimed invention.

Note also that this combination meets the pressure rating limitation in the claims. (See MPEP 2131.03 that states:

"[W]hen, as by a recitation of ranges or otherwise, a claim covers several compositions, the claim is 'anticipated' if one of them is in the prior art." Titanium Metals Corp. v. Banner; 778 F.2d 775, 227 USPQ 773.

5. Claims 10 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Nakamaru et al. and Kessler et al., as applied to claims 1-4 and 6-9 and 11-20 above, and further in view of Kobayashi (U.S. 4,576,784). The Nakamaru et al. - Kessler et al. combination discloses applicant's claims except for the thickness of the containment vessel sidewall.

Kobayashi teaches a boiling water reactor having a reactor pressure vessel with a thickness of about 30 cm. (see column 6, lines 9+). One having ordinary skill in the art would have recognized that the containment vessel of Nakamaru et al. acts in the same manner as a second pressure vessel enclosing the pressure vessel containing the reactor core, and it would have been prima facie obvious to conservatively make second pressure vessel have the same attributes (e.g., sidewall thickness) as the primary pressure vessel.

6. Claims 10 and 21 are rejected under 35 U.S.C. 103(a) as being obvious over the combination of Nakamaru et al. and Kessler et al. In section 3 above, claims 1-4 and 6-9 and 11-20 above, have been shown as unpatentable over the Nakamaru et al. - Kessler et al. combination.

Note that claim 10 depends from claim 1 and claim 21 depends from claim 11. As to the limitation in claims 10 and 21 regarding the thickness of the containment vessel sidewall being between 15 cm and 30 cm, this is a matter of optimization within prior art conditions or through routine experimentation (see MPEP 2144.05 II.A).

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rick Palabrica whose telephone number is 703-306-5756. The examiner can normally be reached on 7:00-4:30, Mon-Fri; 1st Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Carone can be reached on 703-306-4198. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RJP
May 17, 2004


MICHAEL J. CARONE
SUPERVISORY PATENT EXAMINER